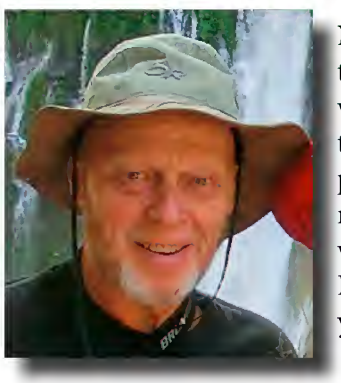
Newsletter of the North American Mycological Association

THE MYCOPHILE

VOLUME 55: 4 JULY-AUGUST 2015 www.namyco.org

# Revisiting NAMA in the Future



David Rust: NAMA President

NAMA is beginning to take great strides — from online foray registration to virtual board meetings; from online elections to a newly designed, member-centric website. These technological innovations herald a new era. It's also encouraging to see continued growth of website visits (over 500 page views per day), Facebook page participants (2,528), and the discussion group (421). After many tries, we've redrawn the regional boundaries and elected new regional trustees. The poison warning poster has been redesigned. We have new people in several key positions. If this reads like a president looking back in the third year of a three-year term — yes, it is.

The membership management package from Vieth Consulting has many features to build community and help us communicate with members. We are still at the beginning of this process; several new features will roll out in 2015. Please note: if you are having trouble with the logging in on the NAMA website, please contact Steve Bichler membership@namyco.org. At this time, you do not have to log in to see all the content unless you want to change/update your personal information.

As NAMA evolves, so should our vision of what NAMA could become, as an educational organization, as a collaborator in research, and as a resource for all things mycological.

## What the Future Might Hold

Looking into the crystal ball, I want to build partnerships with other international mycology groups as well as the Mycological Society of America to promote information sharing and a greater understanding of the role of fungi in the world's complex ecological systems. NAMA has amassed almost two decades of voucher specimens at The Field Museum of Chicago — we can begin to use these collections to further science. NAMA could make a huge impact on research by funding DNA sequences of species in targeted groups (as identified by some of the working mycologists who attend our annual forays).

While the new website is visually attractive, I want to fill in some obvious gaps. We need volunteers to help develop a comprehensive section devoted to basic mushroom information. Other new sections and expanded information are in the works as well. We need local stories and goings-on news from our affiliated clubs.

We can develop informational brochures to assist in the formation of new clubs, for new members, and for organizations outside NAMA who want to learn more about us. We should work with affiliated clubs to develop programs and workshops, and hold brainstorming workshops about common club issues at annual forays.

We need to rethink our approach to organizing annual forays, and add regional forays so that more members can participate in NAMA events.

*(Continued p.3)*

# FORAYS & OTHER EVENTS

This section of **The Mycophile** is reserved for publicizing the forays of NAMA affiliated clubs and other events you may be interested in learning about. If you would like us to list your club's next big event, contact us with details you would like displayed here and send to Dianna Smith, editor of NAMA's bi-monthly newsletter at mycophile@namyco.org.

**July 10-12: Gulf States Mycological Foray:** Wiggins Miss. Wiggins is located between Poplarville and the Pascagoula River. We will be lodged in the Hampton Inn & Suites. Plans are made for food, field trips, and collecting permits. Mycologists will be Dr. Adriana Montoya Esquivel and Alejandro Kong Luz, of the University of Tlaxcala, Tlaxcala, Mexico. We are seeking a student to host for this foray. Cost is $269/single and $344/dbl. Details and registration form are posted on our website http://gsmyco.org or contact dandplewis (@) gmail.com.

**July 30-August 2: NEMF's 39th Annual Sam Ristich Foray** sponsored by the Connecticut Valley Mycological Society (CVMS) will take place at Connecticut College in New London, CT. Guest contributors include Alan and Arleeen Bessette, Gary Lincoff, Renée Lebeuf, Roz Lowen, John Plishcke III, Dianna Smith, Walt Sturgeon, Rod Tulloss, Dorothy Smullen, Ed Mena, Allison Birks, Sue Hopkins, Bill Yule. **Registration form is online until July3!** http://www.cvmsfungi.org/nemfregistration.html

**August 2-8: Mushroom Identification for New Mycophiles: Foraging for Edible and Medicinal Mushrooms** workshop with Greg Marley and Michaeline Mulvey at the Eagle Hill Institute in Maine. Contact office@eaglehill.us.

**August 28-30: 4th Annual Joint Appalachian Foray** at Graves Mountain Lodge, Syria, Virginia, sponsored by The Mycological Association of Washington and the New River Valley Mushroom Club. Walt Sturgeon will be the Chief Mycologist. More details and registration form will be available on MAW's website, www.mawdc.org in March.

**September 4-7: COMA's Annual Clark Rogerson Foray** will take place again in the beautiful Berkshires near Copake NY, where Northwest CT, Southwest MA and NY meet. Guest mycologists include Gary Lincoff, Roz Lowen, Leon Shernoff and Dianna Smith. Check www.comafungi.org for registration information.

**September 6 -12: Ascomycetes, Waxcaps, and Other Fall Fungi of New England** workshop with Alan Bessette and Arleen Bessette at Eagle Hill Institute, Maine. For information on attending the course contact office@eaglehill.us.

**September 17-20: Wildacres Annual Foray** Registration fee for this event is $235 per person, and includes three nights lodging and eight meals double occupancy. The registration form may be found on the NAMA website at http://www.namyco.org/images/pdf_files/Wildacres_Registration_2015.pdf .
Please see http://www.wildacres.org/ for more information about the retreat center, or contact Glenda O'Neal by email: glendakoneal@yahoo.com, or by phone (423) 863-2742 for foray information. This foray is limited to 40 NAMA members. Registration is expected to go quickly this year with the NAMA annual foray in the same area the following weekend.

**September 18-20: Western PA Mushroom Club's 15th Annual Gary Lincoff Mushroom Foray** with Gary Lincoff, Michael Kuo and Chef Tom Chulick. Details at http://wpamushroomclub.org/.

**September 24-27: NAMA Blue Ridge Foray** sponsored by the Asheville Mushroom Club and the Mushroom Club of Georgia at the YMCA Blue Ridge Assembly in Black Mountain, NC. *Registration is now closed.*

*(Continued from p. 1)*
Because of recent FDA rule changes concerning the sale of wild mushrooms, several states have initiated training programs for collectors. NAMA can get involved now to develop regional training programs to make sure the right information is conveyed.

I recently initiated a conversation with the Executive Director at the American Association of Poison Control Centers. We agreed to work together to let all 55 poison control centers in the US and Canada know about the resources NAMA has available, and begin to create educational outreach to prevent mushroom poisonings. Many of our mushroom identifiers work directly with local poison control centers. The NAMA poison syndromes page remains the top-visited page on our website.

## NAMA Needs You!

All of this leads, of course, to you, our NAMA members. If there's a topic I've named above where you would like to get involved, please contact me at president@namyco.org, or call me at 510.468.5014. We need contributors to help create educational brochures, new content for the website and our publications, and we need folks who can lend their expertise to one of our committees. If you're interested in serving on the Board of Trustees, we'd like to hear from you. Get involved. Help build the NAMA you'd like to see.

On a separate note, I want to congratulate our new Regional Trustees: Joe Brandt, Northeast; Bruce Boyer, Mid Atlantic; Milton Tam, Pacific North; and Steven Pencall, Southwest. For a full list of Regional Trustees and the clubs in each region, visit: http://www.namyco.org/regional_trustees.php.

Congratulations are also in order to Jennifer Knox, Marketing Committee, and Steve Bichler, Membership Committee, for a banner year in membership renewals. Thank you for all your hard work.

I look forward to seeing many of you at our foray in Black Mountain, North Carolina, in September. It's going to be a great event! We're very pleased to have such a wonderful group of mycologists and speakers.

David Rust, NAMA President

## IN THIS ISSUE

Message from the President, David Rust....1,3
NAMA Associated Club Forays and Educational Opportunities....2
NAMA 2015 Photo Contest Submission Rules....4-5
Fungus Fotography....5
Puget Sound Mycological Society....6-7
Study Explains Why Some Fungi Glow....8-9
*Cheimonophyllum candidissimum*....10-11
The Genus *Crepidotus* in Newfoundland and Labrador....12-13
Who's in a Name....14-16
In Praise of Non-Charismatic Fungi....17-19
Book Review of *The Wild Mushroom Cookbook*....20-21
Recipe Corner: Easy Chicken for Two....22
Missouri Mycological Society (MOS) Foray at Mingo Wilderness Refuge....22
Letters to the Editor....23
Mushroom Photos of the Issue....24

# NAMA 2015 PHOTO CONTEST!

Every year, NAMA holds a photography contest. With the recent popularity of mushroom photography, many of us already have a picture that can be entered. If not, there is time to start to photographing mushrooms before next year's contest. Entering the photo contest is easy and fun. Everyone who wins first, second or third place award receives a prize. And anyone who enters the contest has at least one of their pictures shown at the NAMA foray at the evening program. One of the winners could be you.

## Annual Photo Contest Rules

**Eligibility**
The photo contest is open to all mushroomers. NAMA membership is not required to enter. Images that have previously won (including honorable mention) are not eligible. Up to 15 images may be entered per person with a maximum of 6 in the Pictorial, 6 in the Documentary and 3 in the Judges Option to make a total of up to 15 images. Closing date: All entries must be received by the Contest Director on or before August 4, 2015. Allow at least one week for mailing.

**Subject Material**
For Pictorial and Documentary, organisms from the Myxomycota (slime molds) and the classes Basidiomycetes and Ascomycetes of the Eumycota ("true fungi") are eligible. For Judge's Option, nearly anything goes, so long as the theme relates to fungi, and fungi are a key element of the photograph.

## Entry Divisions

**Pictorial**
This division is for single photos that illustrate the beauty and variety of fungi in form and color. Mushrooms should not be cut or turned over and look natural. Judging criteria include consideration of both technical (focus, depth of field, exposure, lighting, color, absence of distracting elements) and artistic (composition, color, background, lighting) aspects.

**Documentary**
For single photographs especially suited as illustrations in a field guide or monograph, or for use in a lecture. Emphasis is placed on portrayal of key morphological characteristics such that the usefulness of the image as an identification aid is maximized. Subjects may be shot in the field, laboratory or studio and the photographer has complete freedom to process, manipulate, or orient the specimen in any desired manner to achieve the goal. Close-ups of single features and photomicrographs are acceptable. Judging criteria will be the same as in the Pictorial category but they will be of secondary importance to the overall mycological utility of the photo. Accurate identification of the subject will be a consideration.

**Judge's Option**
For single photos or series which do not fit into the Pictorial and Documentary divisions. Examples include time-lapse series, ecological relationships of fungi (e.g. fairy rings), fungi with animals, people enjoying fungi, humor, etc.

**Awards**
First 2nd and 3rd place prizes will be awarded in Pictorial, Documentary and Judges Option. Honorable Mentions will also be noted for some Pictorial and Documentary photos. Prize(s) such as mushroom books will be given to first through 3rd place winners

**Marking, Listing and Submitting Digitals**
Each digital photo file name should include 3 things, **D** (for Documentary), **JO** (for Judges Option), or **P** (for Pictorial), and the photographer's initials, followed by the Genus and species of the fungi or the title for the Judges Option photo. Digital images may be emailed or mailed on a CD or DVD and will not be returned. Mail images to John Plischke III, 411 Center Avenue, Greensburg, PA 15601 724-832-0271 or by email to Fungi01 [at] aol.com. If emailing images, please include your name, address and phone number. Images can also be submitted

using free file mailing programs such as http://www.mailbigfile.com/ or Dropbox, etc.

**Photo of You**
If possible please include a photo of yourself with your submissions, so we can use it to introduce the photographers. This is not a requirement and the photo of yourself is not counted as an entry. It has also been requested that we start to collect data on where the mushroom photo was taken. We don't need GPS coordinates, but it would be helpful to have a city/county/park/state names to post on the website for future reference.

**Reproduction**
Entry in the contest constitutes the consent of the photographer to allow NAMA to reproduce copies of each winning image (including Honorable mention etc.) for circulation by NAMA Committees, among the membership, NAMA brochures, signs, advertising and affiliated societies. NAMA also reserves the right to post images of the winning images on the NAMA website, for use by the Marketing Committee, and in The Mycophile. All copyrights remain with the photographer.

### Photography Contest Entry

To enter the NAMA photography contest, mail or email your entries to:
John Plischke III
411 Center Avenue
Greensburg PA 15601
(724) 832-0271
Email: John Plischke III: fungi01@aol.com

---

# FUNGUS FOTOGRAPHY

***by Linda Loos Scarth***

Making images of fungi is fun and often a challenge; especially making interesting ones at which the photographer and others like to look. This is where thinking about abstract art may be useful.

Most definitions of abstract art say that it is not a representation of natural or human-made objects, but uses color, shapes, textures and lines to make compositions that the artist finds interesting. Most hope that others also will find their abstract work engaging.

Sometimes fungi provide the possibility of using the lines, shapes, textures and colors to make an abstract photograph. A large cap, or a jelly on a log, or a group of overlapping bodies are all useful for abstraction.

The large mushrooms that are sometimes found in Ellis Park here in Cedar Rapids, IA were the focus of these two abstract images *(see page 24)*. Bob was attracted to the strong lines and color contrasts in the one on the left. Most of his from that afternoon were variations on that theme. I found the textures on some of the caps especially interesting and did variations on that theme. Of course, we also made representational images showing the entire fungi in their environment.

We use close-up lenses but that is not necessary. Normal lenses are fine if the image file is high resolution. Sometimes when using regular lenses we make interesting crops and keep the dimensions small enough to maintain adequate resolution for good color and sharpness. Small images for the web do not need to have as high resolution as those for printing. Pretty 4x6 inch abstracts printed at 300 dpi are attractive on greeting cards.

Keep on having fun with fungi.

(Linda's essay and Bob and Linda's photos first appeared in *Symbiosis* Prairie States Mushroom Club newsletter, Vol. 31:1).

# PUGET SOUND MYCOLOGICAL SOCIETY

Center for Urban Horticulture, Box 354115
University of Washington, Seattle, Washington 98195
(206) 522-603)  http://www.psms.org

By Agnes Sieger

**Founding**: The Puget Sound Mycological Society (PSMS) was the brainchild of three influential advisors: Dan Stuntz, Margaret McKenny, and Dixy Lee Ray, all brilliant teachers and fascinating characters. Prof. Daniel Elliot Stuntz (1909–1983) taught botany at the University of Washington. Because of his presence, the University of Washington became a major center for mycological training and research. As a student during the Depression, Stuntz had little money and often was hungry. Not wanting his studies to repeat his experience, , he provided a free smörgåsbord of gourmet goodies for his classes to munch on. His first question of a new class was, "Who wants wine, who wants beer, and who wants soda pop?" Ms. Margaret McKenny (1885–1969) was a well-known author, lecturer, and nature photographer who introduced many a person to the fascinating hobby of mushroom study, both personally and through her book *The Savory Wild Mushroom*, published in 1962. Known as the little old lady in the black hat, which she wore everywhere, she was long on friends but short on funds. Rumor has it that one time the government threatened to confiscate her land for back taxes. Her friends came up with the perfect solution—they held a massive mushroom hunt and sold enough to a fancy Eastern restaurant to bail her out.

Dr. Dixy Lee Ray (1914–1994) joined the University of Washington in 1945, where she became part of a group of young biological-science teachers that included Dr. Stuntz. Like Stuntz she was dedicated to her students; if deserving graduate students were in danger of dropping out for lack of money, she would pitch in and help split the bill. In the spring of 1963, Dr. Ray was appointed Director of the Pacific Science Center, where she sponsored a number of amateur science societies (including PSMS) as part of her job of communicating science to the lay public. Dr. Ray went on to become chairman of the Atomic Energy Commission and eventually Governor of the State of Washington, but she never lost her enthusiasm for teaching others about nature and science.

In addition to these founding "fathers," much of the success of PSMS is also due to the unflagging efforts of Seattle architect Ben Woo, the society's first president, first field trip chair, first wild mushroom exhibit chair, off and on newsletter editor, and dedicated student and photographer of all things *Russula* in the Pacific Northwest.

**First Meeting**: The first official meeting of the Puget Sound Mycological Society was held March 16, 1964. The new society had 108 members, who elected five trustees, a president, vice-president, treasurer, and secretary. The certificates of membership were signed in *Coprinus comatus* ink.

**First Mushroom Show**: The first show was held Saturday and Sunday, October 24 and 25, 1964, in the Pacific Science Center. They needn't have worried about whether anyone was interested in mushrooms. Two thousand attended the show. It was so successful that Dixie, who had co-chaired publicity, held some of it over for a couple of weeks. PSMS cleared $570 and picked up 28 new members.

**First Survivor's Banquet**: The first survivor's banquet was held March 15, 1965, at Ruby Chow's restaurant on Jefferson Street. The speaker was Angelo Pelligrini, and the menu featured six mushroom species in eight courses. The price? $4.00.

**First Field Trips:** The first field trips were pretty disorganized. It took a year or two to shake out the format. Only one field trip was reported that year, but it was a rousing success, setting the tone for many to follow over the years.
First Year: As President Ben Woo summed up in the January 1965 bulletin: "Finishing our first year as a Society, we can look back on some pretty respectable gains. Starting from scratch, we have become organized, built membership to over 170, held meetings, gone on field trips, issued certificates, got out bulletins (some of them on time), and put on a pretty fair mushroom exhibit. All of us have made new friends, learned new things, and few of us have been poisoned in the process. For these things, we are grateful for the staunch support of Dr. Ray and the Pacific Science Center, for the good humor and generous light shed by Dr. Stuntz, for Miss McKenny's gracious assistance, and for the enthusiasm and hard work of you the members. You are all therefore awarded laurels, on which some of you may rest while others remember that composted laurel leaves are an excellent medium for growing *Agaricus augustus* and *Lepiota rachodes*."

## Research Projects

Over the years PSMS has participated in several research projects concerning the distribution of fungi. The first project was the Morel Study spanning 1972–1984. The idea for this study was conceived by the University of Michigan Mycologist Dr. Alexander H. Smith while visiting Washington State. This project was spearheaded by Joy Spurr, George Rafinelli, Carl Hermanson, and Margaret Dilly under the supervision of Dr. Daniel E. Stuntz.

The second project was the Barlow Pass Study, the results of which were published by Dr. Joseph Ammirati et al. in *McIlvainea* in 1994, Volume 11(2): pp. 10–33. PSMS members performed the bulk of collecting over a period of two years on nearly a weekly basis. This study represents the most complete list of fungi available for silver fir/western hemlock forests. In addition, the study revealed several new taxa (not recorded in the paper) and extended the geographical range for a large number of taxa.

The next project was the MAB Mushroom Study. The six articles published as a result were based on a 3 year, interdisciplinary study looking at socio and biological aspects of chanterelle mushroom harvesting on the Olympic Peninsula in Washington State. They were promulgated in *Ambio: The Journal of the Human Environment,* Special Report No. 9, 1998, published by the Royal Swedish Academy of Sciences, Stockholm.

Currently, PSMS is participating in a study with Dr. Erica Cline which is supported by a grant from the Daniel E Stuntz Memorial Foundation. Dr. Cline's lab at the University of Washington Tacoma will be testing metals in mushrooms collected by volunteers during PSMS field trips this spring and fall. They are testing commonly consumed mushrooms such as chanterelles, boletes, morels, etc. This study will help to understand the impacts of consuming wild mushrooms on human health in regard to toxic metal exposure. The results will help to determine locations in the Puget Sound region where metal accumulation in mushrooms is high and which mushroom species contain levels of metals that might pose a risk to human health based on chronic exposure.

## PSMS Today

Since its inception in 1964, PSMS has become one of the largest mushroom societies in North America, with a present membership (2015) of approximately 1500 people. Members represent a variety of interests in fungi: the pothunter, the adventurous gourmet, the weekend naturalist, the serious amateur, and the professional mycologist.

**Purpose & Activities**: The society has one overall purpose: To foster the understanding and appreciation of mycology as a hobby and a science and to assist related institutions in these purposes. This focus on education in manifested in various ways: through field trips, forays, an annual wild mushroom exhibit, member ID classes, a weekly pubic mushroom ID clinic, and volunteer research projects with, for example, the University of Washington or the Department of Natural Resources. PSMS has also sponsored three NAMA forays (in 1981, 1993, and 2014).

**Grants & Funds**: PSMS maintains two funds to assist mycologically related projects. The Ben Woo Scholarship fund, given at the discretion of the PSMS president, and a recently established small grant program to help fund the study of mycology in Washington K-12 public and tribal schools. PSMS is closely associated with the Daniel E. Stuntz Memorial Foundation, established in 1985 to advance mycological research, education, and appreciation for fungi in the Pacific Northwest.

**Newsletter**: Once a month, September through June, PSMS publishes a newsletter, *Spore Prints*. The newsletter is issued both in a black and white printed version and in a Web version posted in color on the PSMS Website, www.psms.org.

Further details and information about PSMS can be found at http://www.psms.org .

# New Study Explains Why Some Fungi Glow

Mar 20, 2015 by Sci-News.com

**According to a study co-led by Dr Cassius Stevani of the University of São Paulo and Prof Jay Dunlap of the Geisel School of Medicine at Dartmouth, the green light emitted from bioluminescent fungi attracts the attention of insects, including beetles, flies, wasps, and ants, which are apparently good for the fungi because the insects spread their spores. The study also shows that their bioluminescence is controlled by a temperature-compensated circadian clock.**

*Neonothopanus gardneri*. Image credit: Marina Capelari et al, doi: 10.3852/11-097.

Bioluminescence is simply the ability of organisms to produce light on their own. Jellyfish and fireflies might be the most familiar bioluminescent creatures, but organisms from bacteria to fungi to insects and fish make their own glow through a variety of chemical processes.

Glowing fungi have captured the imagination of cultures around the world. They have been well-known for centuries, from the bright orange and poisonous Jack-o-Lantern Mushroom (*Omphalotus spp.*) to the phenomenon known as 'foxfire,' where the nutrient-sipping threads of the Honey Mushroom (*Armillaria spp.*) give off a faint but eerie glow in rotten logs.

Only 71 of more than 100,000 recognized species of fungi produce light in a biochemical process that requires oxygen and energy.

Biologists had believed in most cases that fungi produce light around the clock, suggesting that perhaps it was a simple, if expensive, metabolic byproduct.

The new study, published online March 19 in the journal *Current Biology*, suggests that just isn't so, at least not in the case of *Neonothopanus gardneri*, one of the biggest and brightest of glowing fungi.

Prof Dunlap, Dr Stevani and their colleagues found that the Neonothopanus gardneri's glow is under the control of a temperature-compensated circadian clock. They suggest that this level of control probably helps the fungi save energy by turning on the light only when it's easy to see.

To find out what that green glow might do for the fungi, the team made sticky, fake fungi out of acrylic resin and lit some from the inside with green LED lights.

When those pretend fungi were placed in the forest where the real *Neonothopanus gardneri* is found, the ones that were lit led many more staphilinid rove beetles, as well as flies, wasps, ants, and 'true bugs,' to get stuck than did sticky dark fungi.

The scientists said they are interested in identifying the genes responsible for the bioluminescence in fungi and exploring their interaction with the circadian clock that controls them. They are also using infrared cameras to watch the interaction between *Neonothopanus gardneri* and arthropods, especially larger ones, more closely.

"The findings are not only cool, they are also important in understanding how mushrooms are dispersed in the environment," the scientists said.

"That's key because fungi such as *Neonothopanus gardneri* play an important role in the forest ecosystem."

---

Anderson G. Oliveira et al. Circadian Control Sheds Light on Fungal Bioluminescence. *Current Biology*, published online March 19, 2015; doi: 10.1016/j.cub.2015.02.021

## From *Science Daily*:

Credit: Oliveira, S; CC-BY 4.0

Mysteries in the mushrooms: First records of fungi-feeding gnat larvae from South America
Date: June 10, 2015
Source: Pensoft Publishers
Summary: A team of researchers has found a South American example of interactions between a group of flies and the mushrooms they feed on as larvae. Though this group of flies has more than 1,100 species known from South and Central America, this is the first report of a species from the family being reared from, and associated with, a host fungus from the South America. The study was published in the open access journal *Biodiversity Data Journal*.

"In the long run," mentions Dalton de Souza Amorim, Senior Professor at the Departamento de Biologia, Universidade de São Paulo, Ribeirão Preto, Brazil, "understanding the evolution of the relationships between fungus-gnats (and other fungivores) and the fungi themselves helps us understand the evolution of temperate and tropical forests over the last 145 million years.."

# *Cheimonophyllum candidissimum*

By Andrus Voitk & Greg Thorn

In many respects *Cheimonophyllum candidissimum* resembles *Pleurocybella porrigens*. The main difference is size: this one is over five times smaller; a fruit body 1 cm in greatest diameter would be considered large, although really big ones can grow to 2. It is the poster mushroom for small white wings on wood.

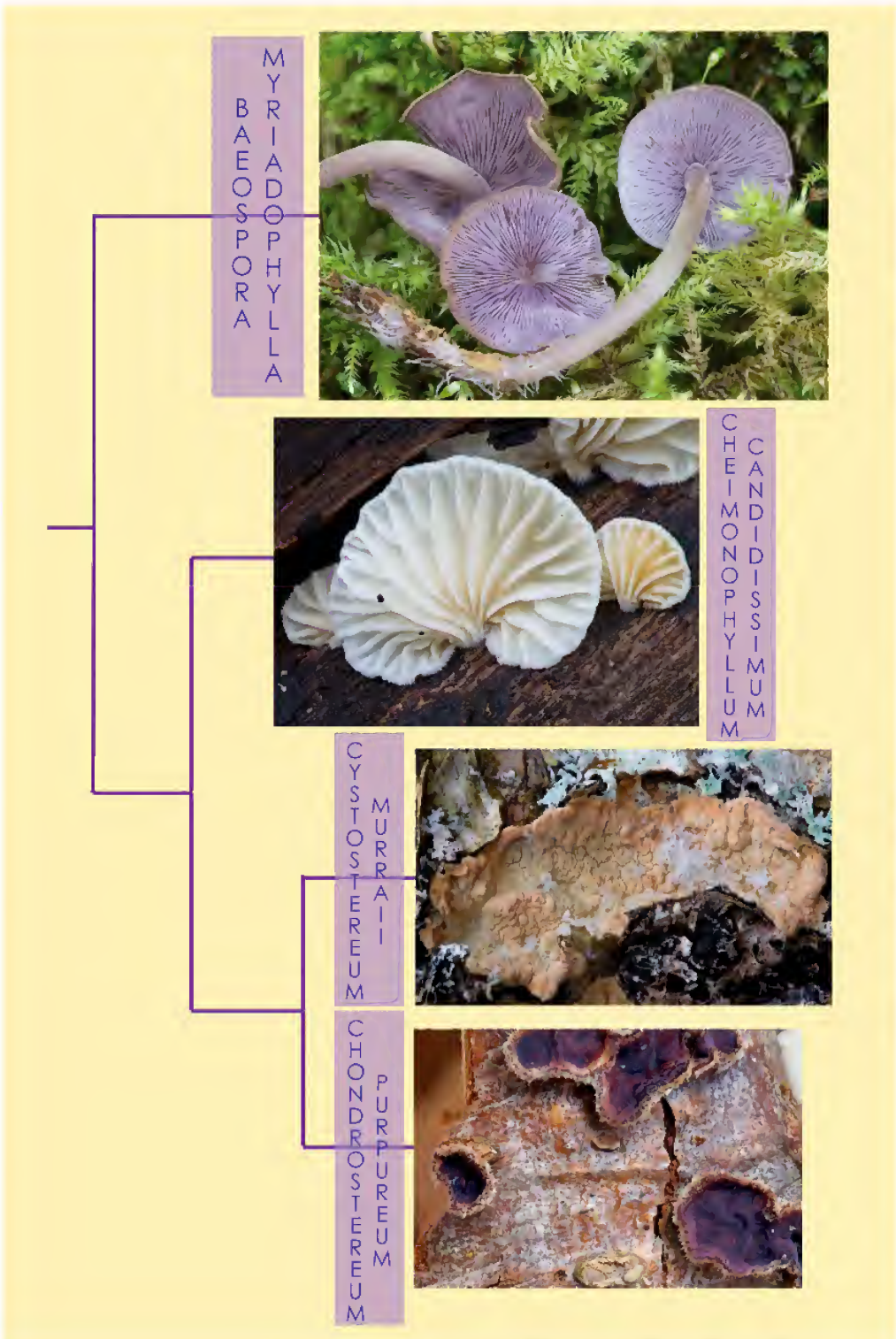
The cap is very finely hairy, becoming silky, and grooved along the gill lines. Initially the edge is turned in, but soon flattens out and may undulate at maturity. Gills are moderately to widely spaced with a minutely hairy edge. Mushrooms are attached by their sides, usually with no stem, although a rudimentary nubbin may be seen. Spores are nearly spherical. The species grows on dead deciduous wood. Where the host was identified with certainty, in our woods it has been found on mountain maple twice and birch once; for two finds alder was suspected, but not ascertained. It fruits in the fall, seeming to continue right into frost.

Over a decade we have recorded it twice in the foray and AV has made five independent collections. Small things often go unnoticed, so it may be much more common than these numbers indicate. It is not nearly as common as *P. porrigens*, but seems to be at least as common as the entire genus *Crepidotus*, to be discussed next.

*Cheimonophyllum* is a small genus with three known species; there may be additional cryptic species and the genus may be polyphyletic. Only the most white, *candidissimum*, has been found here. Its phylogeny is discussed with the diagram to the right. All its close relatives are also wood rotters.

Like *Pleurocybella porrigens*, this species is also a challenge to photograph. Because of its small size, a macro lens is helpful. Even with all the equipment, it is still a never ending quest for that elusive great picture, so vivid in your mind, that you never seem to be able to capture through the lens.

**Figure caption**
The family tree of *Cheniophyllum candidissimum*, showing close relatives found in Newfoundland and Labrador. This small, delicate white mushroom is a sister to some thick, tough, coloured corticiates, including *Cystostereum murraii* and *Chondrostereum purpureum*. Both of these groups together form a sister clade to a group of small stipitate gilled mushrooms, like *Baeospora myriadophylla*. *Cheimonophyllum candidissimum* may be white, but there seems to be purple-lilac blood in the family. This tree does not represent an actual analysis, but is a free adaptation from a study,[1] for the sole purpose to show these relationships. This seeming "progress" made the authors of the study wonder whether it demonstrates evolution from stipitate, gilled mushrooms to wing-like (pleurotoid) gilled mushrooms and eventually to flat (resupinate) ungilled (stereoid) mushrooms.[1]




**Reference**
1. Binder M, Hibbett DS, Larsson K-H, Larsson E, Langer E, Langer G: The phylogenetic distribution of resupinate forms across the major clades of musroom-forming fungi (Homobasidiomycetes). *Systematics and biodiversity* 3:1-45. 2005.

(This article was published originally in *Omphalina*, Vol V, No 11, Dec. 15, 2014 by Foray Newfoundland and Labrador).

# The genus *Crepidotus* in Newfoundland and Labrador

By Andrus Voitk & Greg Thorn

The genus *Crepidotus* has seen some tough times over the years, with various species lumped and dumped in it and others split, as concepts changed, until Cathy Aime redefined it in phylogenetic terms.[1] Unfortunately the same degree of stability has not reached the species left in the genus, which are still defined and redefined by varying interpretations. Although over 130 species have been described in North America,[2] in our province it is a relatively small genus. In a decade we have collected five species, most of them only once. The small fruit bodies grow on wood, either directly attached by the cap (resupinate) or with a lateral attachment by no or a very small, eccentric stem (like a bracket fungus). Caps are small, rarely bigger than 2 cm in the larger species, and vary from white to various brown shades; they are often quite hairy or scaly. The spore print is yellowish tan to brown, quite attractive as brown staining on the gills of pure white specimens.

A brief illustrated description of the species we have identified follows.

***Crepidotus fusisporus***

The above photo adjacent to the title also shows this species. Both collections were made on the same day in the same woods. Hesler and Smith described six varieties of this species.[2] A reassessment of the species has lead others to consider five of the six varieties as one.[3] Predictably, not everybody agrees. The microscopic findings of our two collections place the title banner specimen as *var. fusisporus* and this one as *var. abietinus*, according to Hesler and Smith's descriptions.The latter was originally described from fir, but both our specimens grew on fallen dead branches of birch. The inrolled cap edge is a useful identifying feature.

***Crepidotus applanatus***

This is one of the larger species of *Crepidotus*, with caps up to 4 cm in greatest diameter. On the mainland it is one of the commoner species, possibly seen more readily because of its larger size, but here we have only collected it once. The cap is characteristically smooth or only very finely hairy, and hygrophanous, usually whitish, becoming gray with moisture or age. Gills are crowded. Found on hardwood in the summer. Microscopically it belongs in the group with distinctly spherical spores.

***Crepidotus calolepis***

This species is relatively common on the mainland, but in ten years we have only one collection of it here. It is another big species, whose cap can reach up to 5 cm in widest diameter. Many synonymize it with the type species for the genus, *C. mollis*, but we follow Senn-Irlet and others, who separate the two on the basis of cap appearance and spore size. *C. calolepis* has a scaly cap of a gorgeous light orange-brown color, as seen above even on a dried specimen, whereas the cap of *C. mollis* is smooth; *C. calolepis* also has larger spores.[4] Senn-Irlet describes two varieties, *var. calolepis* and *var. squamulosus*.4 The latter has larger spores, and were we to make that distinction, ours matches *C. calolepis var. squamulosus*.

***Crepidotus cesatii***

We have found only this single sporocarp, growing on balsam fir (together with young *Panellus violaceofulvus* to the left). The macroscopic picture fits with any number of small, white, hairy, resupinate species known to grow on conifer. The microscopic appearance fits best with the European *C. cesatii*, synonymized by some with the European *C. sphaerosporus* and North American *C. variabilis*. Known by small, thin white cap with hairy, inturned edge, distant gills, brown, spiky, almost round spores and a liking for conifers.

***Crepidotus versutus***

This is known to be a subarctic species[4], and became our commonest species thanks to five collections made in Konrad Brook, Labrador. It is just another small, white, fuzzy *Crepidotus*, begging for a microscope to identify it. And, as you have seen, even then identification is not always easy, because of the different species concepts and interpretations over time, as well as the many small characters that have been awarded significance beyond their worth. More than begging for a microscope, all the species of this genus are begging for a thorough phylogenetic revision.

Until then, you can identify them at least to genus by their brown spores, setting them clearly apart from other small white wings on wood.

**References**

1. Aime MC, Vilgalis R, Miller OK: The Crepidoceae (Basidiomycota, Agaricales): phylogeny and taxonomy of the genera and revision of the family based on molecular evidence. *American Journal of Botany*, 92:74-82. 2005.
2. Hesler LR, Smith AH: *North American species of Crepidotus*. Hafner Publishing Company, New York. 1965.
3. Bandala VM, Montoya L: A taxonomic revision of some American *Crepidotus*. *Mycologia*, 92:341-353. 2000.
4. Senn-Irlet B: The genus *Crepidotus* Fr. (Staude) in Europe. *Persoonia*, 16:1-80. 1995

(This article was published originally in *Omphalina*, Vol V, No 11, Dec. 15, 2014 by Foray Newfoundland and Labrador).

# WHO'S IN A NAME?

By John Dawson, contributor to *NJMA News*, newsletter of the New Jersey Mycological Association

This is the first in a series of articles profiling the careers of those who have had mushrooms named after them. A few mushrooms have common names that are eponyms — Caesar's mushroom, Berkeley's polypore, Ravenel's stinkhorn — but many more bear eponymous scientific names, in which either the name of the genus (*Galiella, Hohenbuehelia, Rozites, Underwoodia*), the specific epithet (*atkinsoniana, booniana, cokeri, schweinitzii*) or both are derived from the surname of a person, usually that of a mycologist.

Many biologists object to naming creatures after people, on the grounds that such names have no descriptive value and merely reflect human vanity. But names that are not eponymous aren't always descriptive either. (For example, *Lycoperdon* — Latin for 'wolf fart' — tells us where they come from, of course.) And not all eponyms are flattering; indeed, some (such as *Brefeldia maxima*, the name of a particularly ugly slime mold) were intended to be defamatory! In any case, it is natural in any field of human endeavor to want to memorialize the contributions of major figures, and naming entities (creatures, theorems, devices, highway bridges, even syndromes and diseases) after such people is one way of doing so. That practice helps to guide those interested in the history of a subject to the life stories of some remarkable individuals, and that is the aim of the series of articles to follow, which were inspired by my reading of Barbara and Richard Mearnes' *Audubon to Xantus* (Academic Press, 1992), a compendium of biographical vignettes of those who have been commemorated in names of North American birds.

There are, however, many more species of mushrooms than there are of birds. So before focusing on particular individuals who have had mushrooms named for them, it is necessary to restrict the focus of inquiry. For, strictly speaking, the scientific name of every mushroom includes the name of at least one person. That is so because the scientific names of fungi conform to the International Code of Nomenclature for Algae, Fungi and Plants (ICN) , according to which the complete scientific name of an organism consists of an italicized Latin binomial (the taxonomic device introduced by Linnaeus in his *Species Plantarum* of 1753) together with the name (in roman type) of the authority[1] who applied that binomial to it. In succeeding installments, I shall focus on eponymous Latin binomials. For the benefit of interested readers, however, the rest of this article is devoted to explaining how to interpret citations of authorities, and what their purpose is.

Many field guides, including David Arora's *Mushrooms Demystified* and George Barron's *Mushrooms of Northeast North America*, omit the names of authorities, even when they give synonyms (see below) for some of the names adopted therein. Others, such as Gary Lincoff's *National Audubon Society Field Guide to North American Mushrooms* and Bessettes' and Fischer's *Mushrooms of Northeastern North America,* include them. Most amateur users of such guides take little notice of the citations of authorities, but for those concerned with taxonomy the citations serve two useful purposes: they help one to find descriptions of species in the technical literature, and for binomial names that have been altered, they indicate to whom the original species epithet is due and who placed the species into a different genus.

How citations of authorities are to be given is specified in the ICN. The details are somewhat complicated, because of the need to allow flexibility within the Code to accommodate both advances in scientific knowledge and legitimate differences of opinion among specialists. To begin with, some starting point for taxonomy had to be agreed upon. Previously the starting point for scientific binomials of gasteromycetes, rusts and smuts were those given by Christiaan Hendrik Persoon in his 1801 book *Synopsis Methodica Fungorum*. For all other fungi it was the names given by the Swedish botanist Elias Magnus Fries in his *Systema Mycologicum* of 1821-1832. However, the current Code of Nomenclature accepts fungal names post Linnaeus's *Species Plantarum* (1753) as being valid regardless of whether they were in Persoon's or Fries's books.

But what if *different* investigators happen to apply the *same* binomial to *different* fungi; or what if *different* names are given to the *same* fungus at different times or by different investigators?

The former are called *homonyms* and are treated according to the rule of priority: Only the fungus to which the name was first applied can remain so designated; all others must be renamed. The latter are called *synonyms*, and are more problematic.

Consider, for example, the Brick Cap. Fries called it *Agaricus sublateritius*. The French mycologist Quélet later split up the genus *Agaricus* and placed the Brick Cap in the new genus *Hypholoma*. Later still, the mycologist Karsten split up Quélet's genus and put the Brick Cap in the new genus *Naematoloma*. Authors such as Bessette et al., who accept Quélet's change, call the species *Hypholoma sublateritium* (Fr.) Quél. Those, such as Alexander H. Smith, who followed Karsten instead called it *Naematoloma sublateritium* (Fr.) Karsten. In either case, the name enclosed within parentheses indicates that Fries was the person responsible for the specific epithet, while the name outside the parentheses is that of the person who moved it to the specified genus. The specific epithet itself remains valid and is not changed unless the reclassification would result in a homonym. In that case the specific epithet must be changed as well, resulting either in a *new name* or reversion to a name given earlier (if the reclassification was due to two species formerly considered different now).

[1] Fungi are no longer regarded as plants, but they were by Linnaeus, although their lack of stamens and pistils posed a problem for his classification scheme, which was based on features of reproductive anatomy. Fungi were still considered 'lower' plants in 1900, when the International Code of Botanical Nomenclature (as it was then called) came into being at the first International Botanical Congress. The ICN is now revised every four years, most recently in 2011 at the 18th International Botanical Congress in Melbourne, Australia.
[2] See the Appendix on the next page.

**Resources**
Consult the **International Code of Nomenclature for algae, fungi, and plants** (Melbourne Code) http://www.iapt-taxon.org/nomen/main.php
http://www.iapt-taxon.org/nomen/main.php?page=art13
http://www.iapt-taxon.org/nomen/main.php?page=r50E
http://www.iapt-taxon.org/nomen/main.php?page=art46
For more a more casual method of citation, consult Index Fungorum.

# Newest Issue of McIlvainea is now online!

*McIlvainea* Editor Willow Nero has just published a new issue online. To find the 2014 Toxicology Committee Report and the 2014 Voucher Collection species list, check it out at: http://www.namyco.org/mcilvainea.php.

Georgia Binder of RAMA (Rochester, NY) finds the mother lode of chantrelles on the Finger Lakes Trail, July 2014.

*Photo by Gene Binder*

**Appendix: Some Commonly Cited Authorities for Mushroom Names**

The following list of mycological authorities is taken largely from the database of authorities for plant names and a list of Authors of Fungal Names maintained by the Royal Botanic Gardens, Kew, England. Standard abbreviations for the names listed are printed in boldface. See also the entry "Authors' names" in Ainsworth & Bisby's Dictionary of the Fungi.

Adam **Afzel**ius (1750-1837)
Johannes Baptista von **Alb**ertini (1769-1831)
George Francis **Atk**inson (1854-1918)
Charles David **Badham** (1806-1857)
Frederic **Bataille** (1850-1946)
August Johann Georg Karl **Batsch** (1761-1802)
Giovanni Antonio **Battarra** (1714-1789)
Miles Joseph **Berk**eley (1803-1889)
James **Bolton** (1758-1799)
Appolonaris Semyonovich Bondartsev [**Bondarzew**] (1857-1968)
Hermann Friedrich **Bonord**en (1801-1884)
Jean Louis Emile **Boud**ier (1828-1920)
Julius Oscar **Bref**eld (1839-1925)
Giacopo **Bres**adola (1847-1929)
**F**rancesco **Brig**anti (1802-1865)
**V**incenzo **Brig**anti (1766-1836)
Louis de **Brond**eau (1794-1859)
Christopher Edmund **Broome** (1812-1866)
Jean Baptiste Francois **Bull**iard (1752-1793)
Mordecai Cubitt **Cooke** (1825-1914)
William Chambers **Coker** (1872-1953)
Moses Ashley **Curtis** (1808-1872)
Augustin Pyramus **D**e **C**andolle (1778-1841)
John Baptiste Henri Joseph **Desm**azieres (1786-1862)
Nicaise Auguste **Desv**aux (1784-1856)
James J. **Dick**son (1738-1822)
Johann Jacob **Dill**enius (1684-1747)
L.P. Fr. **Ditmar** (fl. 1806-1817)
Franklin Sumner **Earle** (1856-1929)
Job Bicknell **Ellis** (1829-1905)
Elias Magnus **Fries** (1794-1878)
Karl Wilhelm Gottlieb Leopold **Fuckel** (1821-1876)
Leon Gaston **Genev**ier (1830-1880)
Claude-Casimir **Gillet** (1806-1896)
Robert Kaye **Grev**ille (1794-1866)
Harvey Wilson **Hark**ness (1821-1901)
Paul Christoph **Henn**ings (1841-1908)
Ludwig Samuel Joseph David Alexander von **Hohenbühel** Heufler (1817-1885)
Theodor **Holmsk**jold (1732-1794)
William **Hudson** (1730-1793)
Nicolaus Joseph von **Jacq**uin (1727-1817)
Franz Wilhelm **Jungh**uhn (1809-1864)
Karoly **Kalchbr**enner (1807-1886)
Gustav Karl Wilhelm Hermann **Karsten** (1817-1908)
Petter Adolf **Karsten** (1834-1917)
Calvin Henry **Kauffman** (1869-1931)
Johann Friedrich **Klotzsch** (1805-1860)
Julius Vincenz von **Krombh**olz (1782-1843)
Wilhelm Gottfried **Lasch** (1787-1863)
Harald Othmar **Lenz** (1798-1870)
Jean Baptiste Louis **Letellier** (1817-1898)
Joseph-Henri **Lév**eillé (1796-1870)
Friedrich Wilhelm von **Leysser** (1731-1815)
**K**arl von Linné (**L**innaeus) (1707-1778)
Curtis Gates **Lloyd** (1859-1926)
George Edward **Massee** (1850-1917)
Pier Antonio **Micheli** (1679-1737)
Jean Pierre Francois Camille **Mont**agne (1784-1866)
Andrew Price **Morgan** (1836-1907)
William Alphonso **Murrill** (1869-1957)
Christian Gottfried Daniel **Nees** von Esenbeck (1776-1858)
Wilhelm **Opa**towski (1810-1838)
Narcisse Theophile **Pat**ouillard (1854-1926)
Jean Jacques **Paulet** (1740-1826)
Charles Horton **Peck** (1833-1917)
Christiaan Hendrik **Pers**oon (1761-1837)
Lucien **Qué**let (1832-1899)
Gottlob Ludwig **Rabenh**orst (1806-1881)
Henry William **Ravenel** (1814-1887)
Richard **Relhan** (1754-1823)
Anders Jahan **Retz**ius (1724-1821)
Charles Eduard **Richon** (1820-1893)
Friedrich Wilhelm Gottfried Theophil **Rostk**ovius (1770-1848)
Ernest **Roze** (1833-1900)
Pier Andrea **Sacc**ardo (1845-1920)
Jacob Christian **Schaeff**er (1718-1790)
Joseph **Schröt**er (1837-1894)
Heinrich Christian Friedrich **Schumacher** (1757-1830)
Lewis David von **Schw**einitz (1780-1834)
Joannes Antonius **Sco**poli (1723-1788)
Louis **Secr**etan (1758-1839)
Rolf **Singer** (1906- )
**A**lexander **H**anchett **Smith** (1904-1986)
Soren Christian **Sommerf**elt (1794-1838)
James **Sowerby** (1757-1822)
Roland **Thax**ter (1857-1932)
Louis Rene **Tul**asne (1815-1885)
Lucien Marcus **Underw**ood (1853-1907)
Antonio **Venturi** (1805-1864)
Carlo **Vittad**ini (1800-1865)
Domenico **Viv**iani (1772-1840)
Carl Friedrich Wilhelm **Wallr**oth (1792-1857)
Johann Anton **Weinm**ann (1782-1858)

# In Praise of Non-Charismatic Fungi

By Susan Goldhor of the Boston Mycological Society

It seems to be a basic human trait that we set up scales of value for everything in our world. What do we value and what do we denigrate? Let's forget the vast majority of folks who devalue the whole kingdom of fungi, and look only at mushroom club members and those like us who work at collecting, identifying, and understanding fungi. Of course, the term "mushroom club" says right there what's most highly valued: fleshy fruiting bodies. Not woody polypores, or microscopic endophytes or the mycelia of mycorrhizal fungi, despite the fact that they may be the ones supporting the ecosystem. No, we want collectibles and — most of all — edibles. Because humans are heirarchy-makers, even edibles have a great chain of being in our eyes, with morels at the top and a whole stew pot of undistinguished boletes, honeys, and slightly buggy or hardened sulphur shelves or hens that we picked too late at the bottom. (Personally, I wouldn't put morels on top but I understand their allure, so I'm not going to argue.)

For the inedible fleshy fungi, there turns out to be a separate hierarchy of values. Though few of us would eat an amanita (even an edible one, so powerful is their aura of danger), amanitas warrant awe and admiration. An anthropologist would say that they have "mana". Forayers are more apt to gather round in silent worship than to kick or destroy these elegant beings. Not so russulas. What is it about these colorful mushrooms, which often provide decoration when everything else has gone underground, that makes mushroomers so likely to kick or hurl them? Is it their brittle texture, so that they fragment (instead of gluing a slimy layer to your boot)? Is it the difficulty of identifying them or the fact that if you do identify them, they are unlikely to be edible? The Snohomish County Mycological Society once published an article about russulas, which included the following: "People have developed very creative ways of using russulas. . . when you are walking through the woods you can see russulas that have been used to relieve stress. . .those are the ones that have been kicked. The rest of the russulas you can see will have been already plucked and turned upside down and used as trail markers". And this quote is far gentler than one from a mushroomer who suggested collecting as many russulas as possible and incinerating them. I'm happy to say that those quoted were not members of our club. In fact, BMC member Jeanne Peterson has become a *Russula* specialist and the very difficulty of keying them out has led her to develop a workable system for this, which — to my mind — constitutes a very satisfactory intellectual exercise — better than Sudoku or crosswords. However, if russulas don't exist to be kicked or incinerated, neither do they exist to keep our brains in shape; they are their own selves; mycorrhizal and playing at least one unique role in our forests. If you've ever admired the white flower of Indian pipe (*Monotropa uniflora*, aka the ghost or corpse plant), you can thank the russulas. Indian pipe is one of the rare plants without chlorophyll, which means that it cannot make its own sugars, but must be parasitic on the russula. But one plant can't simply glom onto the roots of another, and suck out a little sustenance. The conduit between the green plants and the white ones turns out to be members of the *Russula* family. There are all sorts of interesting questions one could ask here; for example, Does the donor plant know where its sugar is going? (No answer yet.) Which green plants are donors? (Answer: The trees with which russula forms its mycorrhizas) Does the Indian pipe give something to the *Russula* in return? (So far, no one has found that something.) What signal does the Indian pipe give the russula's mycelium to induce this nutritional handshake? How does the *Russula* decide how much sugar to share — and is this under its control or the control of the parasite? Again, no answers to most of these questions, but you can see why researchers have been fascinated by this relationship, to which entire careers could be fruitfully dedicated.

When we decide that certain mushrooms are boring or worthless, we do it from our limited viewpoints and our

profound lack of knowledge. Apart from appearance, we know very little, but we live in an era of new techniques capable of enriching our understanding to an extent that would have been unimaginable twenty or even ten years ago. The Bible says, "seek and ye shall find", but mycology, like the virtuous life, suffers from a paucity of seekers, although the relatively small number out there are doing amazing stuff and finding wonders.

Photo from Tom Volk's web page: http://botit.botany.wisc.edu/toms_fungi/aug2010.html

I've been fascinated for a while by a small non-charismatic mushroom called *Laccaria bicolor* (*Lb*). *Lb* is of no culinary interest, having been judged "edible but not palatable". It's not particularly beautiful; the violet coloration that gives it its name fades early on. However, unlike most ectomycorrhizal (forming a particular type of association with tree roots) fungi, *Lb* can not only be grown in culture, but also paired with the roots of its partner trees (conifers; generally pines) in vitro, and it was this trait that has led to its being a sort of fungal laboratory rat and the subject of numerous studies, including being the very first ectomycorrhizal fungus to have its entire genome sequenced in 2008. But, before this happened, *Lb* was also the pioneer fungus to show that ectomycorrhizal fungi utilized helper bacteria (fondly known as MHBs or Mycorrhizal Helper you-know-whats) to assist it in the all-important developmental step of glomming onto its partner tree's roots, and forming a kind of fungal-root structure called a mycorrhiza. The MHB in this case was *Pseudomonas fluorescens*, but since then many more bacteria have been shown to help many more ectomycorrhizal fungi, and in more functions than mycorrhization; to the extent that one review paper stated that MHBs have been found wherever they have been looked for.

The MHBs are soil bacteria. In the case of our fungal lab rat, *Lb*, we've learned that the helper bacterium *Pseudomonas fluorescens* carries out a number of functions (some involving the fungal genome) which assists the fungus to survive and grow, up to the point of its glomming on to a plant root. It's interesting to note that, at least in vitro experiments, the relationship between the fungus and its helper bacteria is a kind of inverse parallel to the relationship between the fungus and its tree partner; whereas the tree gives the fungus sugar (glucose) in exchange for macro- and micro-nutrients, the fungal hypha converts that glucose into a non-plant sugar (trehalose) to attract and assist the bacteria and the bacteria gives the hypha thiamine (vitamin B1). (Converting the glucose into trehalose also prevents the plant from taking it back.) In both cases, growth and development are assisted by this mutualistic exchange. I have no doubt that we will find out far more about the costs and benefits to all three of these partners and I also have no doubt that *Lb* will be at the forefront of many of these findings.

(For those whose eyes roll back into their heads at the mere mention of bacteria, you can skip this next paragraph and go straight to the next one, which I think you'll find interesting!)

While there are far more ectomycorrhizal fungi (EcM) than arbuscular mycorrhizal (AM) or ericoid fungi forming mycorrhizal associations with tree roots, only some of them form mushrooms. 90% (more or less) of the world's plants have associations with AM fungi, which are a wildly different sort of beast that do not form fruiting bodies at all and is far less well understood. AM fungi have been known for decades to have obligate symbiotic bacteria, which seem to have been inside them for as long as they've existed. We don't actually know this, but we infer it from the fact that these interior bacteria (or bacteria-like beings) are vertically transmitted through fungal spore generations, have lost their exterior membranes and have taken over a number of functions for their hosts, which improve fungal pre-symbiotic growth and survival. (Presumably, once the fungus has a symbiotic plant partner, their symbiotic bacterial partner is less necessary. Alas, how often we see this pattern among human partners. . .). However, it's only recently that symbiotic bacteria have been found in ectomycorrhizal fungi and you can probably guess which fungus they were found in first. There is still some question about whether the bacteria on the inside

of *Lb* come from the MHBs on the outside of *Lb*, but current opinion is that clever *Lb* can simply utilize a variety of the bacteria hanging around in soil. Pascale Frey-Klett and her co-workers have put it well in their review paper, *The mycorrhiza helper bacteria revisited*: "Interestingly, the two mycorrhizal fungi *Gigaspora margarita* and *L. bicolor* illustrate two different evolutionary processes of the bacterial colonization of fungal cells. *Gigaspora margarita* is an example of long-lasting coevolution between the (endomycorrhizal) fungus and its endobacteria, as suggested by the strict vertical transmission of *Candidatus Glomeribacter gigasporarum* through fungal spore generations, by the small genome size of the endobacteria, and by the difficulties in cultivating these bacteria in vitro. In contrast . . . *L. bicolor* harbours fluctuating endobacterial communities that appear to be environmentally acquired. Whether these endobacteria result from the bacterial biofilms that colonize the hyphae extracellularly remains to be determined. Our hypothesis is that the intracellular colonization of *L. bicolor* by soil bacteria would confer on the fungal host the ability to adapt to changing environments, especially during its presymbiotic life in the soil."

Looked at very simply, mycorrhizal fungi supply their tree partners with water and soil nutrients in exchange for sugars (since only photosynthesis can make a sugar; all the rest of us can only build on what the plants have made). As everyone who's ever bought fertilizer knows, the major nutrients that plants need are N-P-K, or nitrogen, phosphorus and potassium. So it's no surprise that the major nutrients supplied by the plant's fungal partner are nitrogen and phosphorus, which fungi generally get by digesting decaying plant material. The *Lb* genome shows a greatly reduced number of cellulases — enzymes that can digest plant material in soil. Since forming the mycorrhizal connection involves a more benign breakdown of plant surface material, given that the fungus has to invade the root cells, *Lb* does have cellulase type enzymes analogous to those in plant pathogens. After all, pathogens are the specialists in breaking down living plant defenses. More surprisingly, *Lb* even has one enzyme resembling snake venom. On the other hand, its genome shows an enhanced number of enzymes that can digest protein, as well as the kind of carbohydrates that might be found in animals or bacteria. The *Lb* genome was published in 2008, but John Klironomos, a researcher who has specialized in surprising findings about fungi and their ecosystems (and who has spoken to our club twice) was seven years ahead, foreseeing this aspect of *Lb*'s genome when he noticed that *Lb* was not eaten by the small soil invertebrates, such as springtails and mites, that normally dine on fungi. When other fungi were grown with springtails, the springtails thrived and multiplied. But when the springtails were grown with *Lb*, the springtails died, and all of those dead springtails were found to be internally infected by *Lb*. Innocuous-looking little (above-ground) *Lb* is a real predator underground. It first immobilizes the still living unfortunate springtails — John and his coauthor suggest that *Lb* may produce a toxin to paralyze its prey before hyphal invasion. (Presumably this would be the enzyme resembling snake venom seen seven years later in the genome and surprising those scientists.) By adding pine seedlings to this micro-system, they were able to show that *Lb* can extract nitrogen from both living and dead springtails; that much of this nitrogen was then transferred to the pine seedlings; that 25% of the seedling's nitrogen was animal in origin (but transferred only by the fungus), and that the pine seedlings grown with *Lb* gained more biomass than the pine seedlings grown with other species of (kinder, gentler) mycorrhizal fungi.

I do most of my foraying in the southern White Mountains of New Hampshire, in the town of Tamworth. Tamworth's boundaries include a conservation property called "Big Pines"; a lovely area for hiking that does indeed contain a lot of really big white pines. In fact, it contains what is believed to be the largest white pine in New Hampshire and perhaps in New England. Why do white pines grow so large so rapidly? Well, now we know. It's all the fertilizer they get from their undistinguished little companion fungus, *Laccaria bicolor*.

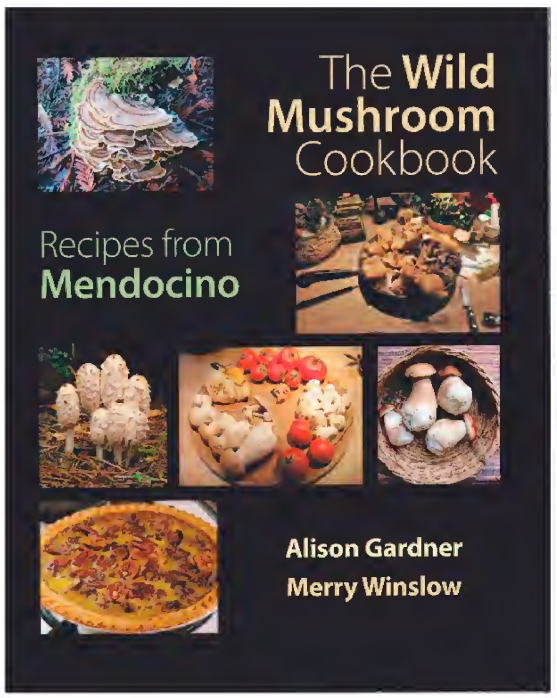
Proust said (heavily edited and paraphrased), "The only real voyage of discovery consists not in seeking new landscapes, but in having new eyes." So, before we kick, incinerate, stomp on or sneer at some mushroom for being inedible or drab or difficult to identify, perhaps we should stop and look at it with new eyes.

May we all gain this ability!

(This article first appeared in the BMS newsletter, the *Bulletin*, March 2015, Vol. 70:1.)

# The Wild Mushroom Cookbook: Recipes from Mendocino

Alison Gardner and Merry Winslow
2014, Barefoot Naturalist Press
Mendocino, CA
978-0990440000 (272 pages, paper, $24.00)




Food52 founders Amanda Hesser and Merrill Stubbs launched their now-renowned website based on the notion of "genius" recipes—recipes that "change the way you think about cooking." Recipes that are elegant, easy, original, and translate from kitchen to kitchen, coast to coast. Readers alert genius editor Kristen Miglore to their finds, and post comments on the weekly selection. *The Wild Mushroom Cookbook* offers several such genius recipes from a passionate community of resourceful, woodsy Californian mushroom hunters. We, too, are resourceful and woodsy—two out of three—which was enough to discover some of the book's genius recipes that worked spectacularly in our Iowa kitchens.

This extensive collection is the result of years cooking and sharing successes. The back cover of *The Wild Mushroom Cookbook* claims it offers "the most comprehensive collection of wild mushroom recipes ever assembled." Indeed, it would take years to make the 299 recipes in the book. Not only do the mushrooms featured in the book span the west coast collection season, the mushrooms and recipes that the authors have collected span years. Gardner and Winslow met in a mushroom identification class at the College of the Redwoods; their professor, Teresa Sholars, wrote the book's foreword. Several recipes in the book were created by students in Sholars' 1981 class for a booklet called "Gathered Mushroom Recipes." Other recipes come from friends and acquaintances in the Mendocino region.

With so many recipes to choose from, it was easy to find dishes that appealed to our tastes. And unlike any other mushroom cookbook we've seen, *The Wild Mushroom Cookbook* has extensive chapters on drinks and desserts, courses that we rarely neglect. Most of the recipes we tried withstood the book's test of time and distance. Some of the recipes, however, such as the "Vegan Hedgehog Sandwich Spread," felt slightly old school in their ingredients, techniques, and taste. Likewise, some recipes we tried seemed too light-handed on spices—especially pepper and fresh herbs—which required a re-seasoning at the end. This doesn't bother us; we're confident cooks who like to play around and compare notes. But if you prefer to follow recipes exactly, keep your eyes peeled for the ones that list familiar levels of herbs and spices.

That doesn't mean some of the less-spiced recipes didn't dazzle. One of our favorites was the super simple "Mushroom Ratatouille" (though we doubled the marjoram and added fresh parsley and basil). It never ceases to amaze us how delicious mushrooms can be in the simplest surroundings; here: sautéed with onions, eggplant, green peppers and tomato sauce. Because it's difficult to get fresh cauliflower mushrooms in Iowa, we used fresh Chicken of the Woods from a recent monster haul. The result: easy, hearty, and delicious.

The recipe for "V9 juice" was a Eureka moment; it turned V8 juice, already a favorite savory drink, into a umami shot. It smoothed the acidic edge of V8 and was good warm or chilled. The next time we make it, we'll introduce it to some ice cubes and a lonely bottle of pepper vodka in the back of the cupboard. This concept will also work well with local wild mushrooms: in the fall, we can find puffballs as big as goats and make a quart of puffball powder overnight. This powder is shockingly intense and will surely be as marvelous an addition to the V8 as dried porcinis from the grocery store.

Because of the oily blandness of most of salad dressings, we often skip them and just eat our veggies the way rabbits do. But in "Mushroom Soy Vinaigrette," mushroom powder transformed oil and vinegar as it did V8 juice. (We used dried matsutake). The powder also acted a great thickening agent, giving the dressing a more bold substance. It was delicious on a bowl of fresh pea shoots and flavorful enough to transform rabbit food into a civilized salad. Shrimp will be next. The instructions say to make the dressing a day in advance. Do it. An overnight rest sets it right.

Another intriguing technique was smoking mushrooms, as used in "Smoky Eggplant Dip." Smoking the mushrooms for twenty minutes away from direct heat imbued them with a rich, mellow flavor you could eat without any additions. The dip itself incorporated sour cream which gave it a smooth, cool, but slightly 80s note. We added fresh herbs, salt and pepper to the finished product, but it was well worth the fix to experience the pleasure of smoked 'shrooms. We wondered the effect that different wood chips would have of different species of mushrooms. Now there's a cookbook.

The bright, vibrant Asian flavors of Salmon and Matsutake Oriental Salad stood out. We'd double the dressing and add something crunchy like nuts, water chestnuts (talk about old school), or (gasp) crumbled Ramen noodles. Black trumpet cream of nettle soup was good and practical — homely even, given the color that results when you blend black with the green drab of cooked nettles. As the headnote observes, black trumpets and nettles are a "winter forager's delight." Nettle is out here anytime but winter so it does coincide with black trumpets and any other mushroom you'd find. Even better, it called for only 2 cups of nettle; has anyone ever managed those recipes that call for 2 pounds? "Mushroom Bread" was a great accompaniment, but it would've been superb if the filling had been doubled. We opted for sundried tomatoes instead of the Kalamata olives, which gave the bread a tangy robustness.

Mendocino is candy cap land: the book is full of wonderful sounding recipes using them: candy cap glazed nuts, candy cap upside down cake, candy cap ice cream soda . . . Luckily, we can find them on the internet—but at prices that inspire restraint. We chose the candy cap cornbread with bacon fat and crumbled bacon. Sweet and salty almost always spices things just right. This bread also had a fine crumb that distinguished it from most corn breads; perhaps the 1/4 cup of powdered candy caps absorbs some of the liquid in the batter.

*The Wild Mushroom Cookbook* contains genius recipes for every cook—no matter where you live—that will help you discover wild mushrooms' ingenious potential. It's a joy to see what a thriving community of mycophiles can cook up!

**Mushroom Soy Vinaigrette** (reprinted with permission)

Makes about 1 cup
½ cup olive oil
¼ cup rice wine vinegar
¼ cup soy sauce
½ teaspoon toasted sesame oil
1 tablespoon ground dried matsutake or porcini or ¼ cup fresh minced matsutake
½ teaspoon thyme
½ teaspoon tarragon
½ teaspoon powdered ginger
1 small clove garlic, pressed Put all ingredients in a jar and shake well to blend or mix in blender until smooth. Best if made a day in advance of using to allow flavors to meld.

Barbara Ching and Jennifer Knox

# RECIPE CORNER

By Peggy Horman

## Easy Chicken Mushroom for Two

1/4 lb. bacon cut into half inch pieces
1 shallot chopped
2 cloves of garlic minced
3 cups of very fresh "Chicken Mushroom"* cut into bite size pieces
Sprigs of fresh thyme or oregano
Broth (chicken or vegetable)
1/4 cup of cream
Salt and pepper to taste
Grated Romano cheese

Cook bacon in skillet until crisp. Remove to paper towel and drain.
Lower heat and add chopped shallots and minced garlic and sauté until soft. Add mushrooms and stir so that nothing browns. Add broth to keep juicy as needed. When mushroom pieces have turned a nice orange, add thyme or oregano. Then add cream and salt and pepper to taste. Mix in bacon pieces and serve over noodles, pasta, rice, etc. Udon noodles are highly recommended.

* Either *Laetiporus sulphureus* (top photo) or *Laetiporus cincinnatus (bottom photo)*
(Peggy's recipe first appeared in the Long Island *SporePrint, Volume 22, Number 3, 2014)*

---

## Annual Foray at Mingo Wilderness Refuge

*Lovingly called "Mingo", the Missouri Mycological Society (MOMS) will be presenting its annual weekend foray on* ***Thursday, October 1 – Sunday, October 4, 2015****.*

Mingo contains 21,592 acres and lies in a basin formed in an ancient abandoned channel of the Mississippi River. It also contains a 7,730-acre wilderness area designated by Congress under the 1964 Wilderness Act to "…protect and preserve the wilderness character…for the use and enjoyment of the American people in a way that will leave these areas unimpaired for future use and enjoyment as wilderness." MOMS is very lucky because we are allowed to mushroom hunt at the refuge and go into areas not allowed by the general public.

We stay at a rustic Girl Scout Camp nearby, have many mycologists to help us identify our finds and eat very well.

This year, Noah Siegel, mycologist, photographer, and wonderfully engaging person, will be our featured speaker. He is sure to delight us all.

The cost is as low as it possibly can be with registration being $65 for the week end (plus a small cost for camping or cabins) …which includes Friday, Saturday, Sunday breakfast; Saturday lunch, and Saturday gourmet dinner. Thursday and Friday dinners are potluck and always amazing! On Sunday there is an incredible mycophagy tasting.

As you know, mushroom people are some of the best. You won't want to miss out on beautiful scenery, unusual habitat, ample mushrooms, educational speakers, delicious food and great friends.

***Check out the MOMS web site at www.MoMyco.org to register…and don't delay!***

# Letters to the Editor

I'd like to correct several mistakes in Nicole Read's description of my ethnomycology presentation to MAW (*The Mycophile* March-April 2015):

"The round gall that grows on rhododendron," an *Exobasidium* species, is sometimes eaten on the coast of south-east Alaska, not in the Central Canadian Arctic, as Ms. Read says.

*Amanita muscaria* wasn't consumed by Native people "across the Americas." Its traditional use is limited to a few places in Alaska and the Yukon.

In my talk, I suggested that the Oracle at Delphi might have owed her powers to ergot, but even more likely, the inhalation of methane.

To my knowledge, *Piptoporus betulinus* has never been used as an insect smudge by Native people.

I don't think there's any evidence that Otzi used *Fomes fomentarius* as an anti-parasitic agent. The evidence — traces of pyrites in the hyphal strands — indicates that he used it as a fire-starter.

I never called *Phellinus igniarius* "the False Birch Polypore." Its common name is "False Tinder Polypore."

Best Wishes,
Lawrence Millman

---

**Correction**: In the biography of NAMA Foray guest mycologist Todd Elliott published in the May-June edition of *The Mycophile*, his web site address was hyper-linked to a different site with someone having the same name. The correct address and link is http://toddelliott.weebly.com/.

---

Dear Editor,
I was more than a little dismayed to see the use of *Auricularia auricula-judae* -a pejorative which has not appeared in any modern American field guide in the twentieth century- in your last issue, March/April 2015, on page 5 as the caption for a photo of the Wood Ear. *Auricularia auricula* has been the preferred name here since 1918 when Lloyd proposed its substitution "as cumbersome and...a slander on the Jews". Publications in Europe and Britain, where antisemitism is on the rise, retain its use as well as the more opprobrious "Jew's Ear". Its usage here is doubly inappropriate, since that species has been shown to be absent from North America, where several other distinct species exist, including *A. americana*.

No doubt its usage here is an oversight, but it is the sort of oversight people should think twice about before committing.

An informative and erudite article on the history of this epithet by David Rose, originally published in *Spores Afield*, may be accessed at www.limyco.org by scrolling down on the homepage and clicking on *Sporeprint*, Summer 2005.

Sincerely,
Joel Horman, editor, *LI Sporeprint*

---

**I am always looking for original articles on NAMA associated club histories, your thoughts on specific mushrooms, recipes, dyeing with fungi, propagation, photos and mushroom hunting experiences. Send your contributions to mycophile.namyco.org.**

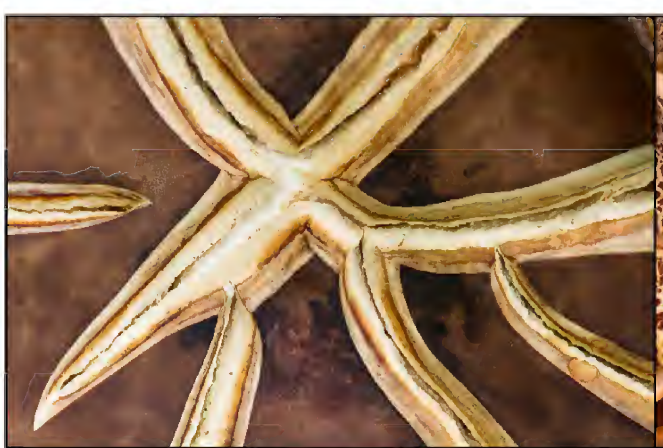
**North American Mycological Association**
Steve Bichler
6018 Illinois Lane SE, Unit B
Lacey, WA 98513-3617

**Change Service Requested**

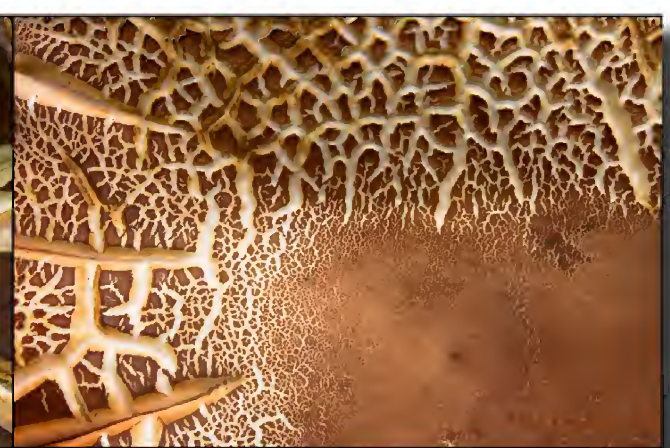
Newsletter of the North American Mycological Association
THE MYCOPHILE

# Abstract Macro Photos of Unidentified Bolete Caps

by Linda Loos Scarth of the Prarie States Mushroom Club (PSMC)



Shows cracks in bolete cap



Illustrates cracks and reticulation on a bolete cap.